

# **U.S. ATLAS Research Phase**

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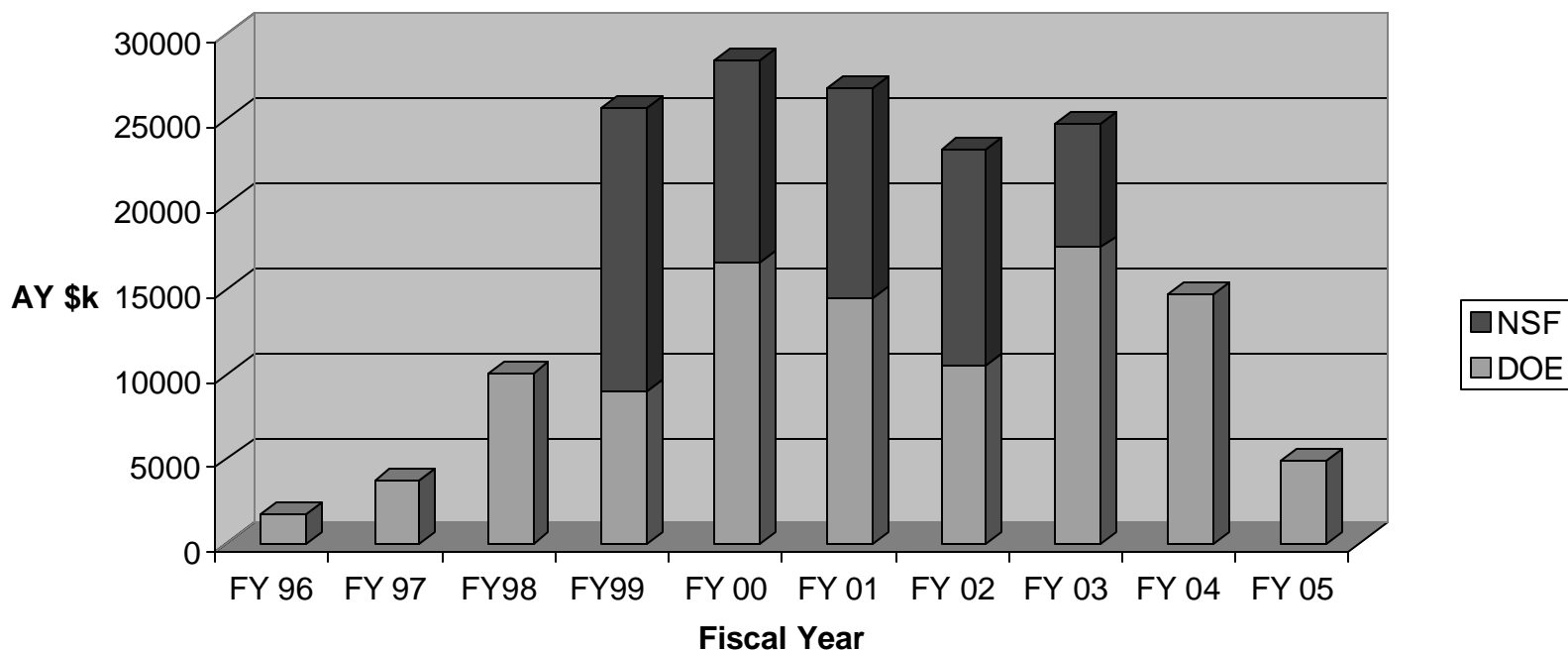


# **M&O + C&I + Upgrade R&D ....+Computing&Software**

- **DOE Guidance of March 2002 states that one figure will be given for each year starting 2002, to be applied by U.S. ATLAS Management to cover all the Research Phase Categories listed above---will NSF follow the same system?**
- **The level of DOE Guidance is far below the needs we have been preparing to present at the April M&O Review. A different kind of plan must be set quickly, and NSF funding for 2002 and later is the first key factor in devising this plan.**
- **By describing the impact of the latest Guidance, we appeal for a revision.**



# U.S. ATLAS Funding

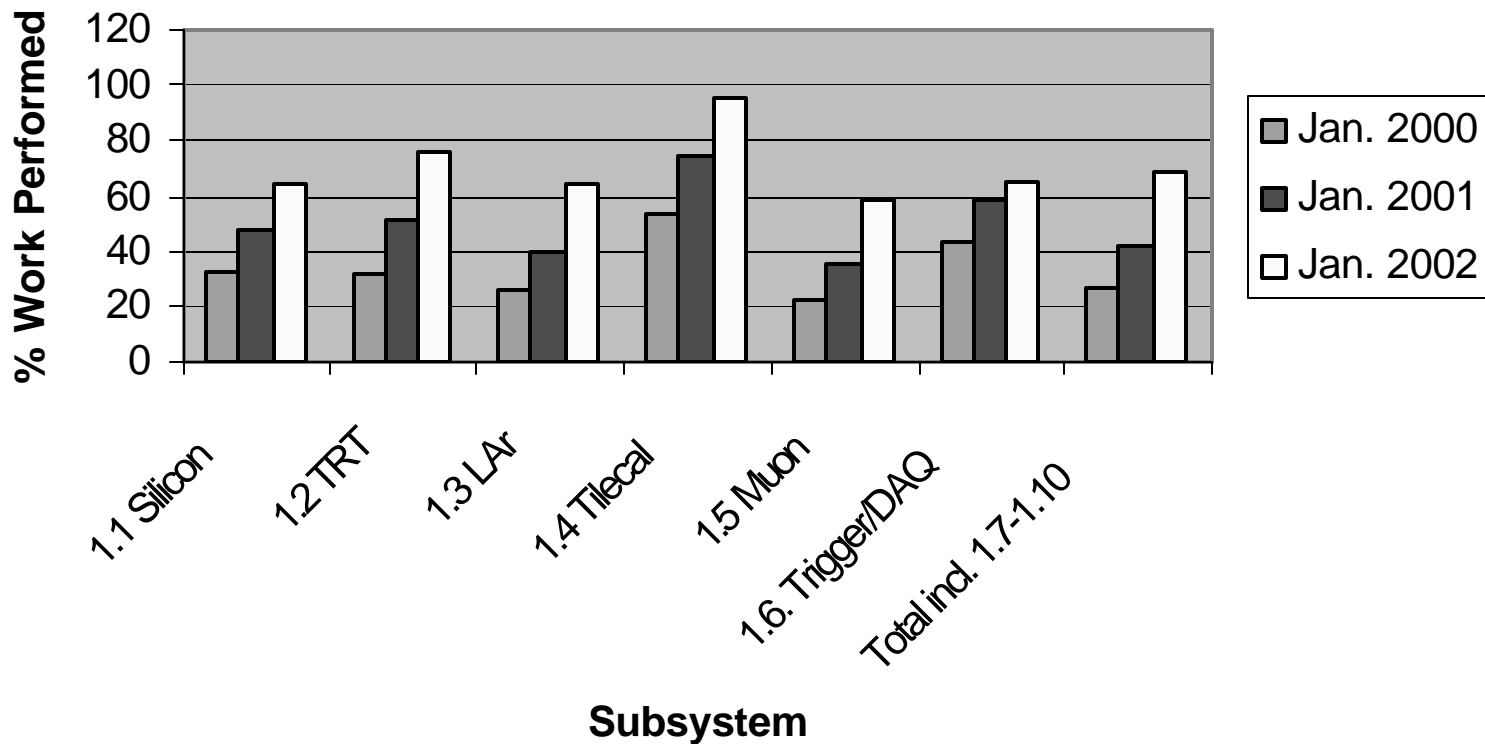


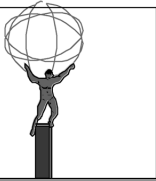
AY k\$											
Agency	FY 96	FY 97	FY98	FY99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	Total
DOE	1700	3710	10050	8999	16494	14475	10507	17416	14690	4909	102950
NSF				16630	11940	12290	12650	7290			60800
<b>Total</b>	1700	3710	10050	25629	28434	26765	23157	24706	14690	4909	163750



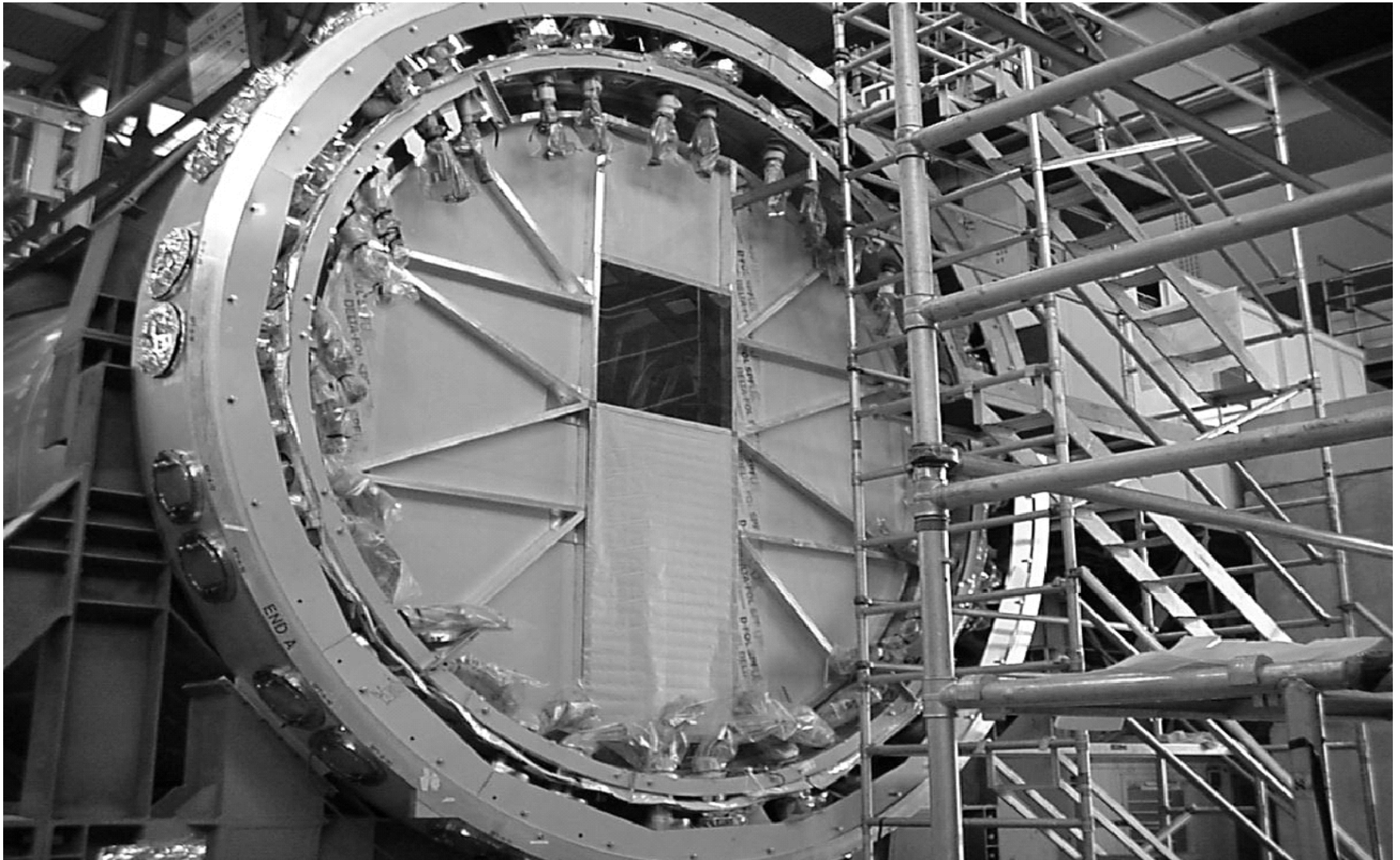
# Status of Construction

**Change in Work Performed from Jan. 2000 to Jan. 2002**





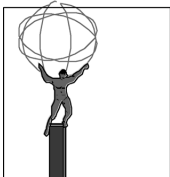
# U.S. ATLAS Detector Components are at CERN – Liquid Argon Barrel Cryostat and Feedthroughs



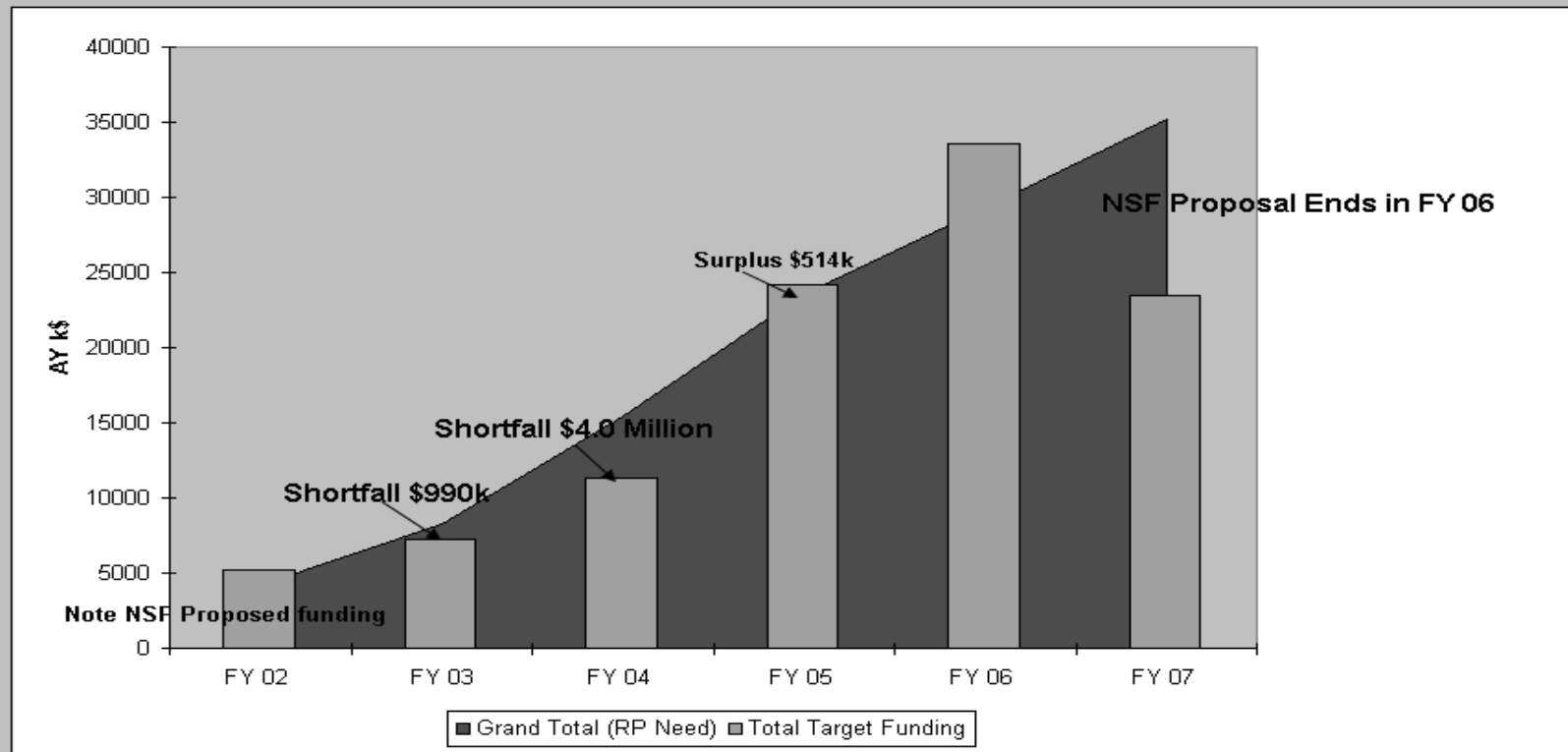


# M&O and Upgrade R&D + Computing

WBS	Description	AY \$k					
		FY 02	FY 03	FY 04	FY 05	FY 06	FY 07
<b>3.0</b>	<b>U. S. ATLAS M&amp;O</b>	<b>489</b>	<b>3371</b>	<b>6804</b>	<b>9721</b>	<b>10947</b>	<b>13216</b>
3.1	Silicon	194	431	526	779	1168	1737
3.2	TRT		449	1200	917	603	512
3.3	Liquid Argon		394	1330	1486	1993	4124
3.4	TileCal	206	989	986	1372	1077	881
3.5	Muon	0	238	745	1418	1685	1686
3.6	Trigger/DAQ		0	94	374	870	1017
3.7	Common ATLAS	89	453	1062	1489	1340	984
3.8	Education / Outreach		106	169	209	253	261
3.9	Project Office		311	320	1021	1056	1087
3.10	Technical Coordination		0	371	656	900	927
<b>4.0</b>	<b>U. S. ATLAS R&amp;D Upgrade</b>	<b>0</b>	<b>0</b>	<b>930</b>	<b>1743</b>	<b>3294</b>	<b>1806</b>
4.1	Silicon		0	748	944	1946	519
4.2	TRT		0	0	0	0	0
4.3	Liquid Argon		0	182	799	1348	1287
4.4	TileCal		0	0	0	0	0
4.5	Muon		0	0	0	0	0
	<b>Reserve @ 25% of M&amp;O and R&amp;D</b>	<b>124</b>	<b>843</b>	<b>1934</b>	<b>2866</b>	<b>3560</b>	<b>3755</b>
<b>2.0</b>	<b>Computing w/reserve</b>	<b>3581</b>	<b>4017</b>	<b>5745</b>	<b>9292</b>	<b>11469</b>	<b>16380</b>
	<b>Grand Total (RP Need)</b>	<b>4193</b>	<b>8231</b>	<b>15413</b>	<b>23621</b>	<b>29270</b>	<b>35157</b>
	<b>Construction Project</b>	<b>23157</b>	<b>24706</b>	<b>14690</b>	<b>4909</b>		
	<b>DOE RP Guidance @3/02</b>	<b>2550</b>	<b>3350</b>	<b>4400</b>	<b>13000</b>	<b>22500</b>	<b>23500</b>
	<b>NSF Proposal</b>	<b>2617</b>	<b>3891</b>	<b>6973</b>	<b>11135</b>	<b>11122</b>	<b>?</b>
	<b>Total Target Funding</b>	<b>5167</b>	<b>7241</b>	<b>11373</b>	<b>24135</b>	<b>33622</b>	<b>23500</b>
	<b>Need vs. Target</b>	<b>974</b>	<b>(990)</b>	<b>(4040)</b>	<b>514</b>	<b>4352</b>	<b>(11657)</b>



# Total Research Funding “needs” + assuming the NSF proposal is fully funded still leads to Budget Shortfall in FY03 and FY04



	AY k\$					
	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07
DOE RP Guidance @3/02	2550	3350	4400	13000	22500	23500
NSF Proposal	2617	3891	6973	11135	11122	?
<b>Total Target Funding</b>	<b>5167</b>	<b>7241</b>	<b>11373</b>	<b>24135</b>	<b>33622</b>	<b>23500</b>

Shifts prior computing profiles by a fiscal year and holding FY 03 to \$4 million dollar budget



# Constraints on a new Plan for reduced Research Phase funding

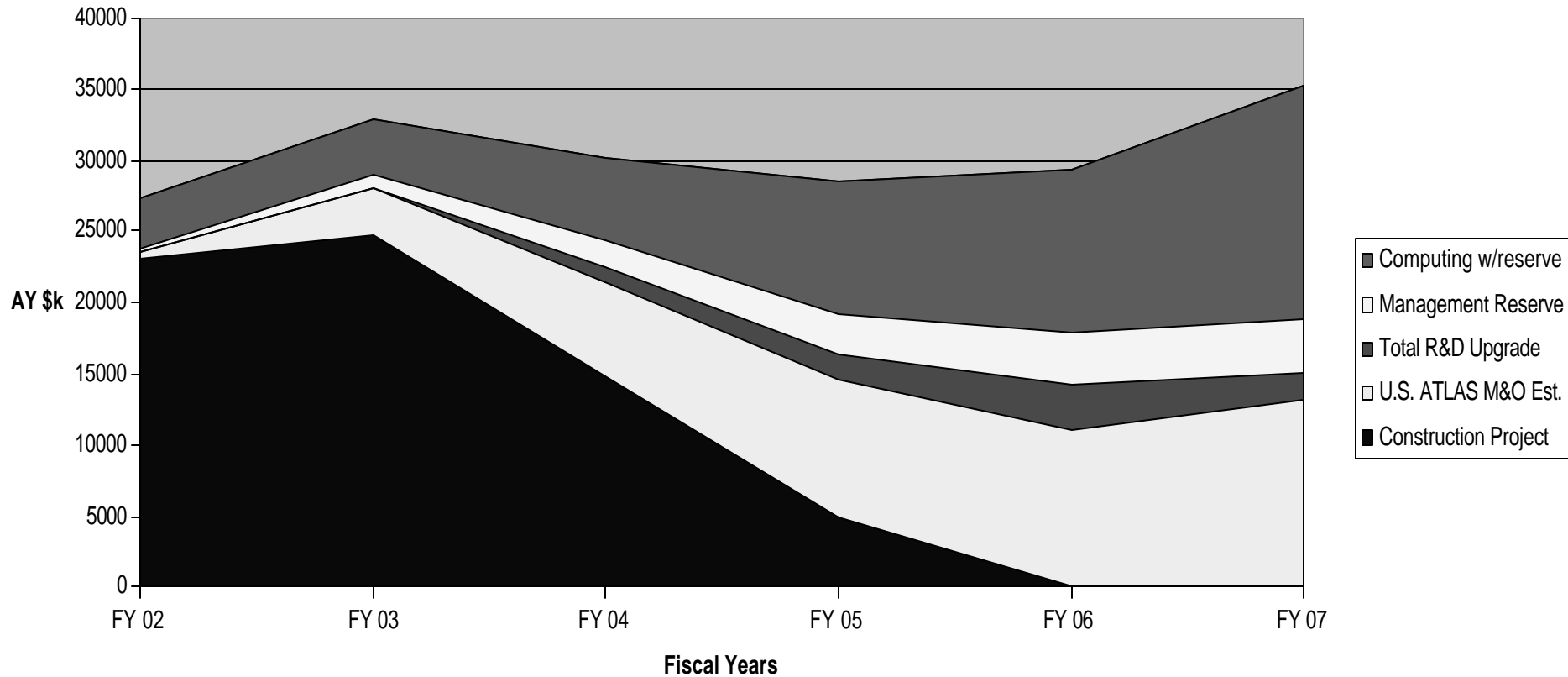
- **Our Construction Project has worked to a well-defined list of detector deliverables: large complex systems being delivered now to CERN**
- **U.S. teams are starting to put these into operation now, since it is not possible to put systems into the very inaccessible experiment without sufficient operation on the surface**
- **These teams have the skill and knowledge to do this, disastrous to leave them sitting in storage and hope to run them later, with different teams**
- **Consequence is that this work has the highest priority**
- **If funds are much lower than expected, other work such as computing, must take a lower priority**





# Total U.S. ATLAS Program

## U.S. ATLAS Research Program





# Impact on Computing

- **The priority we must give to operations in the next few years means that much of the impact will fall on Physics and Computing. It will be important to recall that:**
  - **Of all HEP projects active *or* planned, the LHC has, *by far*, the largest discovery potential for critical issues in fundamental physics**
  - **This SWC area is critical to the successful performance of the physics and to the participation of U.S. scientists**
  - **The U.S. is taking a central role in computing, and has had a large impact**



# Impact on Computing

- The U.S. has played an absolutely crucial role in ATLAS Computing, e.g. control/framework, infrastructure for the database
- Our efforts take advantage of commonality of software in many areas with solutions in conjunction with other experiments: control framework/LHCb, ROOT data systems/STAR
- U.S. ATLAS developments in grid tools are central to the LHC Grid Computing Project and is working with U.S. CMS, LIGO, and Sloane SS to develop common grid software and Tier 2 computing centers
- With the present budget scenarios, we lose much of our work force



# A Proposal at the Limit:

- **Given the delay in LHC turn on, we propose to slow down the ramp of the Tier 1 center at BNL and delay final hardware for Tier 2**
- **The cost of maintaining the Tier 1 facility with no growth is about \$1M/year**
- **We believe that the support of the current core developers and a small increase in grid integration effort is critical to physics success**
- **The cost of the core developers and grid integration is about \$2.5M/year**
- **These are the minimum efforts to maintain a plausible physics program for U.S. ATLAS**